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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/985,737	11/06/2001	Yoshinori Terui	215891US2	4230

22850 7590 11/24/2004

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1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

KEANEY, ELIZABETH MARIE

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 11/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/985,737

Applicant(s)

TERUI ET AL.

Examiner

Elizabeth Keaney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 4 and 9-11 is/are allowed.
- 6) ☒ Claim(s) 5 is/are rejected.
- 7) ☒ Claim(s) 6-8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The Amendments and Remarks filed 2 September 2004 have been entered.

Response to Arguments

Applicant's arguments filed 2 September 2004, with respect to claims 1,4,9,10 and 11 have been fully considered and are persuasive. The rejection of claims 1,4,9,10 and 11 has been withdrawn.

Priority

It is acknowledged that no foreign priority has been claimed.

Drawings

Applicant's arguments with respect to the drawing objections have been fully considered and are persuasive. The objection has been withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Veneklasen et al. (US Patent 6,392,333; hereinafter Veneklasen) in view of Shinada et

al. (US Patent 5,616,926; hereinafter Shinada) in further view of Takigawa et al. (US Patent 4,430,570; hereinafter Takigawa).

Veneklasen discloses, in figure 2 and throughout the disclosure, an electron gun comprising:

- an electron emission cathode (14);
- a control electrode (16); and
- an extractor (24),
 - wherein a tip of the electron emission cathode (14) is located between the control electrode (16) and the extractor (24) (column 2, lines 46-47).

However, Veneklasen fails to teach or fairly suggest the electron emission surface of the electron emission cathode being circular flat. Veneklasen further is silent as to the material from which the electron emission cathode is made.

Shinada discloses, in figures 4(c and d) and throughout the disclosure, an electron emission cathode having an emission surface which is circular flat.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the circular flat electron emission cathode for the electron emission cathode of Veneklasen because it stabilizes the current density of the cathode and decreases the damage to the tip of the cathode thereby improving the lifespan of the device (Shinada; column 5, lines 50-column 6, line 11).

Shinada further discloses the electron emission cathode to be made of tungsten (column 5, line 64).

However, Veneklasen and Shinada fail to teach or fairly suggest the electron emission cathode to be made of a rare earth hexaboride.

Takigawa teaches the substitution of a rare earth hexaboride electron emission cathode for that of a tungsten electron emission cathode (column 1, lines 54-66).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the cathode of Takigawa for that of Veneklasen and Shinada because it provides sufficient luminance while increasing the lifespan of the device (Takigawa; column 1, lines 65-66).

Allowable Subject Matter

Claims 1,4 and 9-11 are allowed over the prior art of record.

Claims 6-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Re claims 1,4 and 9-11: The best prior art of record discloses an electron gun comprising: an electron emission cathode; a control electrode; and an extractor,

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wherein the electron emission cathode is made of rare earth hexaboride and a tip of the electron emission cathode is located between the control electrode and the extractor, and wherein an electron emission surface of the electron emission cathode is spherical. However, the prior art fails to teach or fairly suggest an electron gun comprising an electron emission cathode wherein the apex angle of the tip is 50-100 degrees, as claimed in claim 1. Claims 4 and 9-11 are allowable by virtue of their dependence.

Re claims 6-8: The best prior art of record discloses an electron gun comprising: an electron emission cathode; a control electrode; and an extractor, wherein the electron emission cathode is made of rare earth hexaboride and a tip of the electron emission cathode is located between the control electrode and the extractor, and wherein an electron emission surface of the electron emission cathode is circular flat. However, the prior art fails to teach or fairly suggest an electron gun comprising an electron emission cathode wherein the diameter of the flat electron emission surface is 5-200 μm , as claimed in claim 6. Claims 7 and 8 are allowable by virtue of their dependency.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Keaney whose telephone number is (571)272-2489. The examiner can normally be reached on Monday-Thursday 5:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571)272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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DAVID V. BRUCE
PRIMARY EXAMINER